

FAIR OF THE AMERICAN INSTITUTE.

Since our last issue new machines have been introduced, and the fair has become more varied and extensive. We continue our notices.

VALVES OF STEAM-ENGINES.

On March 10th, 1849, Geo. H. Corliss, of Providence, R. I., patented an invention for attaching the governor of a steam-engine directly to the induction valves in such a manner that the speed is regulated by varying the point of the cut-off; if the speed increased, the expansion of the balls of the governor caused the steam to be cut off at a shorter part of the stroke, and if the speed diminished, the fall of the balls kept the valves open and allowed a full head of steam during a greater part of the stroke. The idea had been previously suggested, but it was first rendered really of practical value by Corliss' combinations, and when reduced to practical use was found to effect a great saving of steam, and consequently of fuel. Messrs. Corliss & Nightingale began to sell their engines on the plan originated by Watt. They would take a certain fixed price, or would take the value of the coal saved by their engine in a given period in doing the same work as had been done by an ordinary steam-engine, at the option of the purchaser. In all cases the purchasers, after a fair and thorough comparison of the Corliss engine with the one displaced by it, decided to pay the fixed price rather than to give the value of the coal saved during the period agreed upon. Already the practical application of this simple idea has saved hundreds of thousands of dollars' worth of fuel to the users of steam-engines, and it has very justly yielded a handsome fortune to the man who accomplished it.

The established and unquestionable superiority of the Corliss engine in the economy of fuel has stimulated inventors to devise other means of connecting the governor with the induction valve, so as to accomplish the same results as Mr. Corliss without violating his patent; and any one who will go through the history of these inventions must be impressed with the boundless fertility of ideas in the minds of our inventors. If we remember rightly, there were eight different engines, in which the governor operated on the induction valve, exhibited at the fair last year. On page 8, this volume of the SCIENTIFIC AMERICAN, we illustrated an engine of this character, invented by Crumie & Briggs, of No. 177 Lewis street, New York, and in another column will be found some statements of what it has accomplished. In the fair this year there are three engines in which the cut-off is varied by the governor. One of these is operated by a link connection, which varies the slide of the valve by raising or lowering the fulcrum of a crank. This is Uhry & Luttgen's patent of March 20th, 1855, and Sept. 7th, 1858. The engine was made by Todd & Raferty, of Paterson, N. J. Another engine has C. A. Schultz's patent cut-off, illustrated in No. 13 of the present volume, in which the governor turns a cam on its shaft and thus varies the point at which the induction port is closed. The third engine was made at the Novelty Works, in this city, and has C. H. Reynold's cut-off—the simplest of the three. In this the puppet valves are operated by one rod, while another rod, connected with the governor, enters the steam chest and, by its turning, varies the point of the stroke at which the valves close. It would be impossible to give a full idea of these several devices without diagrams, but the great interest which the subject is attracting among engineers has induced us to note what is being exhibited in this department at the present fair.

STEAM PUMPS.

There are a number of steam pumps in the fair. Holmes & Foster, of Brooklyn, N. Y., have a direct-acting, straight cylinder pump, in which the cylinder of the pump is on a line with the cylinder of the steam-engine, and the valves are shifted by an arm on the piston-rod, which simply strikes a shoulder on the valve-rod at each stroke. They say that they run a small engine with this valve at the rate of 1,500 strokes a minute.

MOLDING-MACHINE.

S. M. Hamilton, of Baltimore, Md., has in operation a molding-machine, which, though the result of five inventions by three men, and producing a wonderful variety of effects, is one of the simplest machines conceivable. An upright cutter-head, provided with suitable slots for receiving the cutters and a set screw to hold

them, is capable of a great number of combinations. The molding is pressed close to the cutter by a cam and drawn away by a spring, producing a wave in the molding, and finally, by the simple process of feeding the molding diagonally to the cutter, more varied and beautiful effects are produced.

COFFINS.

A very neat model of Marshall's coffin, described and illustrated in another column of this week's SCIENTIFIC AMERICAN, is on exhibition, and attracts considerable attention.

BEE-HIVE.

Francis Hart & Co., No. 63 Cortlandt-street, New York, have placed in the fair a hive of live bees, which are busily at work and which pass in and out of the hive through holes which are covered with little hanging doors of zinc, which are intended to keep out that moth of which the larvae are so destructive to the honey bee. It is the invention of Mr. Steele, and is said to be perfectly effectual, the moths not being sufficiently strong to push open the doors while the bees can do it with ease. Two sets of doors are provided, one swinging inward for the entrance of the bees and the other swinging outward for their exit.

CAST-STEEL PLOWS.

In No. 15 of the present volume, in speaking of Stenton's landside-cutter, we remarked that the plow to which it was attached was of cast-steel, and was the handsomest plow that we had ever seen. The cast-steel plow is the product of a series of western inventions, the clayey soil of that region having stimulated inventors to devise a moldboard so fashioned and polished that it would not load with dirt, however adhesive the soil. Their efforts have been crowned with success. The graceful moldboard of the cast-steel plow, with its polished surface as smooth as glass, will turn a clean furrow through any field which it is possible to find. The plow in the fair, of which we have spoken, was made by John Deere, of Moline, Ill., and we venture the opinion that it has never been surpassed by any plow which has ever been seen on the face of the earth.

WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page.

MACHINE FOR CUTTING OUT BOOT AND SHOE SOLES.

This invention consists in the use of a suitable die attached to an arbor which has an intermittingly rotating movement and also an up-and-down movement, and so operated that the die will cut out the soles from the leather alternately in opposite positions as regard the toe and heel, and thereby produce the work with the least possible waste of "stock," and by an exceedingly simple means. The invention also consists in the peculiar means employed for operating the arbor and die, both as regards the rotating and up and down movement, and the gaging or determining of the length of each movement. The invention further consists in a novel means employed for operating a gage, whereby the same, at the proper time, serves as a stop to secure proper adjustment of the leather beneath the die, and is removed at the proper time to permit the cut soles and refuse to be discharged from the platform, previous to each cut of the die. The invention consists lastly, in the employment of an adjustable bed to receive the die, so arranged that it is made to withstand the action of the die much longer than if stationary. The patentee of this improvement is W. Munroe, of West Auburn, Maine.

IMPROVEMENTS IN ELECTRO-MAGNETIC TELEGRAPHS.

With this invention a great progress has been made in bringing telegraph instruments to perfection. To transmit 2,000 words an hour is considered exceedingly well done with Morse's instrument; while with this instrument it is easy to transmit from 10,000 to 15,000 words. The dispatches are set up by types which together with the composing stick form a portion of the circuit, and which are so arranged that a double closing of the circuit is effected as each tooth comes in contact with the closing mechanism. The dispatches are recorded by means of a siphon pen, either in a continuous line or by dots or lines exactly in the same characters in which they are represented by the types, so that each man may

use his own signs and that a dispatch can be transmitted with perfect secrecy. The inventor of this instrument is Dr. L. Bradley, of Folsom, Cal.

MANUFACTURE OF ILLUMINATING GAS.

In the manufacture of illuminating gas, more especially in its manufacture from resin, resin oil, or oils or fats of any kind, the accumulation of carbon on the sides and bottom of the retort has heretofore been a source of great annoyance, requiring the frequent stoppage of the process to clean out the retort. The object of this invention is to obviate this difficulty, and to enable gas to be made continuously; and to this end the nature of the invention consists in the admission to the retort, during the gas-making process, of chlorate of potassa or other substance in which there is an excess of oxygen which will combine with the excess of carbon in the gas-making material, and cause it to pass off from the retort as gas. The inventor of this device is Alfred Marsh, of Detroit, Mich.

GASKETS FOR STEAM AND OTHER JOINTS.

These several materials at present employed for gaskets in making steam joints, are all liable to serious objections. Copper, which makes the safest joints, requires to be so tightly screwed-up as to produce frequent breakage of bolts and caps. Lead is liable in a less degree to the same objection, and besides seldom makes a perfectly tight joint; and india-rubber, which is in some respects the best, is liable to blow or squeeze out, or to be destroyed in removing the caps. The object of the present invention is to obviate these difficulties, and it consists in making a gasket of a ring of india-rubber, partly encased with copper, or other tough but ductile metal, by which means the safety and neatness of the copper gasket are combined with the steam-tight quality possessed by india-rubber, besides obviating the necessity of such tight screwing-up as to be liable to break the bolts and caps, and preventing the gaskets being injured by the removal of the caps or other portions of the joints. This is the invention of J. S. Colvin, of Alleghany City, Pa.

CHROMATIC KEY-BOARD FOR PIANO-FORTES.

This invention by Mathieu Philippi, of Troy, N. Y., consists in so constructing the upper surfaces of the several keys of a piano-forte, that, while the ordinary form of the key-board is preserved, portions of all the keys are brought to the same level in the key-board, the principle object of such construction being to facilitate the playing of chromatic passages, but other advantages being obtained by it.

HYDRAULIC ENGINE.

The object of this invention is to obtain a means whereby water may be advantageously used as a motor in those cases where there is but little fall. The invention consists in the use of lever frames provided with buckets having sliding bottoms, and used in connection with gates attached to pen-stocks, the gates and sliding bottoms being connected with the working parts as to be operated automatically and cause the water to actuate the lever frames, so as to impart a continuous rotary motion to a shaft from which the power is taken. This contrivance is the invention of Miles Keely, and G. W. Cressman, Barren Hill, Pa.

INVENTORS who apply for patents should be cautious not to confer upon their agents by power-of-attorney, the right to withdraw the \$20 in case the application should be rejected. Honorable agents do not care to receive this particular power, unless there is some express consideration beforehand whereby they should be clothed with it. Our reasons for this caution is that rejected cases are frequently coming into our hands for examination, and upon proceeding to discharge the duty, we find that the agent, by virtue of the power-of-attorney, unwittingly signed by the inventor when he executed the papers, has withdrawn the application and received back the \$20. This leaves the unadvised inventor no other alternative but, either to abandon his claim, or incur the expense of a new application.

A small pamphlet, in which is given some useful tables showing the width of belt necessary to be used for producing different amounts of horse-power, how to put bands upon pulleys to avoid kinks, &c., may be had gratis by addressing the New York Belting and Packing Company, 37 Park-row, this city.